

IN THE CLAIMS

Please cancel Claim 15.

REMARKS

1. The application was filed with 23 claims. Claims 1-23 are pending in the application. Claim 15 has been cancelled as a duplication of Claim 13. The Examiner has restricted the examination to Claims 1-19 on the grounds that Claims 20-23 are combinations distinct from the subcombinations of Claims 1-19. Traverse of the restriction is maintained. Applicant thanks the Examiner for finding allowable subject matter in Claims 2-3, 5, 8-9, 11-12, and 17-18 if rewritten in independent form including all the limitations of the base claim and any intervening claims. Reconsideration by the Examiner of the claims still pending and not found allowable is respectfully requested.

2. The Examiner has rejected claims 1, 4, and 6 under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,154,064 to Robert Proebsting ("Proebsting"). The Examiner states that Proebsting discloses in Fig. 1 a circuit that essentially comprises the invention disclosed in Claims 1, 4, and 6 of the present application, in that Proebsting discloses a circuit having a two-transistor positive amplifier (transistors 16 and 17) and a two-transistor second amplifier (transistors 16 and 17), with the connections as described in para. 2 of the Office Action.

Applicant traverses the rejection on the grounds that the circuit of Proebsting has significant restrictions that severely limit its use. Fig. 1 of Proebsting has two portions, element 60, to which the Examiner refers, and element 70, on the right side of Fig. 1. The text of Proebsting itself teaches against the use of the sense amplifier circuit 60 depicted in Fig. 1, stating that the "sense amplifier often does not generate output voltage signals capable of reaching the limits of a positive and negative voltage supply," and that requires the use of an additional amplifier 70. Col. 1, line 66, to col. 2, line 11. Element 60, with the four transistors mentioned above, also includes what appears to be a transistor-switch, element 28, labeled "enable."

Element 60 is described in the accompanying text in col. 1, lines 54-58, as an amplifier that requires a voltage supply exceeding a sum consisting of three transistor threshold voltages plus the differential voltage generated at the output terminals of the amplifier. Thus, as Applicant understands circuit 60 of Proebsting, the voltage supplied between terminals 30 and 40 will be, for example, the combined Vce of transistors 14, 16, and 28, plus the (relatively small) voltage difference between transistors 14 and 16, that is, the differential voltage generated by the amplifier. This circuit thus requires a relatively large voltage supply, i.e., "a voltage supply exceeding three transistor threshold voltages plus the differential voltage generated at the output terminals of the amplifier." Col. 1, lines 55-58.

The present invention is not so limited. As depicted in Fig. 4A, for instance, and as claimed in 1, there is no "switch" transistor requiring more voltage from the power supply. Thus, the voltage supply required will be little more than the Vce of transistors 72 and 76, or the combined Vce of transistors 74 and 78, in addition to the voltage difference from the amplification of the input signal. Thus, as stated in the application, the claimed circuit uses nearly all the available positive input voltage. Application, p. 6, lines 2-4. Embodiments of the present invention, then, include an amplifier circuit in which the switch is not present as shown in Proebsting. No voltage "headroom" is wasted with a switch or other unnecessary components.

The prior art must be considered in its entirety, including disclosures that teach away from the claims. MPEP 2141.02, at 2100-120. In this case, the application describes circuits that Proebsting teaches against, in that the "sense amplifier often does not generate output voltage signals capable of reaching the limits of a positive and negative voltage supply." Col. 1, line 66, to Col. 2, line 11. The circuit of Proebsting includes a switch which limits the operation of the amplifier and therefore does not describe or suggest the claimed invention. Therefore, Proebsting does not anticipate the claimed invention, and the Examiner is requested to withdraw the rejections of Claims 1, 4 and 6 under 35 U.S.C. § 102(e).

3. The Examiner has rejected claims 7, 10, 13-16, and 19 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,215,364 to Changku Hwang et al.

("Hwang") in view of U.S. Pat. No. 6,154,064 ("Proebsting"). The Examiner states that Proebsting discloses a delay unit and that Hwang discloses a voltage controlled oscillator comprising delay units connected together. With reference to Claims 7, 13, and 15, the Office Action states that it would have been obvious that the circuit of Proebsting could be used in the oscillator circuit of Hwang "as an alternative method of implementing the delay units using fewer transistors for the advantage of saving space and lowering costs." Office Action, para. 4. The Office Action also states that as for Claims 10, 14, 16 and 19, Hwang discloses an additional delay unit.

Applicant traverses the rejections under 35 U.S.C. § 103(a). It is improper to combine the references, since there is insufficient motivation to combine. In addition, the combination would be unworkable, and the improper, unworkable combination does not disclose or suggest all the limitations of the claimed invention.

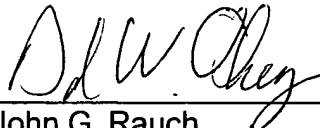
The Office Action states that one would be motivated to combine Proebsting with Hwang for the purpose of "using fewer transistors for the advantage of saving space and lowering costs." Office Action, para. 4. But Proebsting teaches against the use of the circuit 60 made of transistors 14-17 and 28, stating that the circuit has many disadvantages, and that the adjacent circuit 70 is required to adequately amplify the voltage input to the input terminals of circuit 60, and that even so, the circuit consumes a high current and yields a relatively slow response. Col. 2, lines 51-55. The chief disadvantage of using Proebsting's circuit 60 is that it requires a high voltage supply "exceeding a sum consisting of three transistor threshold voltages plus the differential voltage generated at the output terminals of the amplifier." Col. 1, lines 55-58. As a result, and as discussed above for the § 102(e) rejections, the additional output amplifier 70 is to be used with circuit 60 of Proebsting. Thus, combining Proebsting with Hwang would not save transistors and would be costly in terms of extra voltage, high current, and slow response. The prior art must be considered in its entirety, including disclosures that teach away from the claims. M.P.E.P. 2141.02. There is insufficient motivation to combine the references.

In addition to the disadvantages cited above, the NMOS transistors (14-17, 28) of Proebsting may have difficulty fitting into the circuit shown in Fig. 2 of Hwang, in which upper transistors 30-33 are PMOS and lower transistors 34-38 are NMOS. Using

CMOS technology, the combination would likely be more expensive or take up more space than desired. At a minimum, the combination would not be a "drop-in" replacement, and the resulting circuit would require at least the extra voltage "headroom" mentioned above, as compared with the claimed invention. Thus, the combination may be unworkable. Even the improper, unworkable combination of Hwang and Proebsting does not describe the inventions claimed in Claims 7, 10, 13-16, and 19, because of the many restrictions of Proebsting's circuit, as described above. The Examiner is respectfully requested to withdraw the rejections of Claims 7, 10, 13-16 and 19 under 35 U.S.C. § 103(a).

4. Applicant again thanks the Examiner for finding allowable subject matter in several claims if rewritten in independent format with all their limitations and those of the base claim and all intervening claims. Applicant requests that the Examiner reconsider the application and withdraw the rejections for anticipation and obviousness. Claim 15 has been cancelled in order to place the Application in form for allowance. Applicant respectfully requests the Examiner to advance the Application to allowance.

Respectfully submitted,



John G. Rauch
Reg. No. 37,218
David W. Okey
Reg. No. 42,959
Attorneys for Applicant

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200